# Lower Colorado River Multi-Species Conservation Program

*Balancing Resource Use and Conservation*

## Beal Lake Conservation Area

## 2018 Annual Report

**February 2020**

**Work conducted under LCR MSCP Work Task E1**

# Lower Colorado River Multi-Species Conservation Program Steering Committee Members

### Federal Participant Group

Bureau of Reclamation
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
Bureau of Indian Affairs
Western Area Power Administration

### Arizona Participant Group

Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
Central Arizona Water Conservation District
Cibola Valley Irrigation and Drainage District
City of Bullhead City
City of Lake Havasu City
City of Mesa
City of Somerton
City of Yuma
Electrical District No. 3, Pinal County, Arizona
Golden Shores Water Conservation District
Mohave County Water Authority
Mohave Valley Irrigation and Drainage District
Mohave Water Conservation District
North Gila Valley Irrigation and Drainage District
Town of Fredonia
Town of Thatcher
Town of Wickenburg
Salt River Project Agricultural Improvement and Power District
Unit "B" Irrigation and Drainage District
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users' Association
Yuma Irrigation District
Yuma Mesa Irrigation and Drainage District

### Other Interested Parties Participant Group

QuadState Local Governments Authority
Desert Wildlife Unlimited

### California Participant Group

California Department of Fish and Wildlife
City of Needles
Coachella Valley Water District
Colorado River Board of California
Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
San Diego County Water Authority
Southern California Edison Company
Southern California Public Power Authority
The Metropolitan Water District of Southern California

### Nevada Participant Group

Colorado River Commission of Nevada
Nevada Department of Wildlife
Southern Nevada Water Authority
Colorado River Commission Power Users
Basic Water Company

### Native American Participant Group

Hualapai Tribe
Colorado River Indian Tribes
Chemehuevi Indian Tribe

### Conservation Participant Group

Ducks Unlimited
Lower Colorado River RC&D Area, Inc.
The Nature Conservancy

# Lower Colorado River Multi-Species Conservation Program

## Beal Lake Conservation Area

## 2018 Annual Report

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**Lower Colorado River**
**Multi-Species Conservation Program**
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**Boulder City, Nevada**
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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BLCA | Beal Lake Conservation Area |
| FY | fiscal year |
| Havasu NWR | Havasu National Wildlife Refuge |
| HCP | Habitat Conservation Plan |
| LCR MSCP | Lower Colorado River Multi-Species Conservation Program |
| lidar | light detection and ranging |
| Reclamation | Bureau of Reclamation |
| USFWS | U.S. Fish and Wildlife Service |

# CONTENTS

Page

## Tables



## Figures

# 1.0 INTRODUCTION

The purpose of this annual report is to summarize all activities that have occurred at the Beal Lake Conservation Area (BLCA) from October 1, 2017, through September 30, 2018, which is Federal fiscal year (FY) 2018. Use of Colorado River water is presented for the calendar year, January 1 through December 31, 2018, consistent with the Colorado River Accounting and Water Use Report: Arizona, California, and Nevada, Calendar Year 2018 (Bureau of Reclamation [Reclamation] 2019).

## 1.1 Background

Reclamation's Lower Colorado Regional Office, in partnership with the Havasu National Wildlife Refuge (Havasu NWR), initiated the backwater improvement project at Beal Lake and subsequently riparian restoration to meet the conditions of compliance set forth by the 1997 Biological and Conference Opinion issued by the U.S. Fish and Wildlife Service (USFWS) under the guidance of the Endangered Species Act. The riparian area was initially used to test and demonstrate restoration and management techniques.

In 2001, Beal Lake was dredged to create a refuge for native fishes. The dredge material was distributed over the adjacent area to be planted with native riparian vegetation. The riparian restoration area was constructed in two phases: the first started in 2002 and the second in 2004. Details of the plantings in each field can be found in the 2005 annual report (Reclamation 2005). The project area, which is divided into fields that can be independently irrigated and managed, was designed to provide an area to test various riparian restoration methods and techniques for site preparation, planting, irrigation, monitoring, managing, and maintenance.

As the test fields grew into established stands of native trees, several Lower Colorado River Multi-Species Conservation Program (LCR MSCP) targeted species began to inhabit the site, and in April 2010, the site was approved as the BLCA by the program's Steering Committee. The BLCA contributes approximately 116 acres of the cottonwood-willow (*Populus fremontii-Salix* spp.), marsh, honey mesquite (*Prosopis glandulosa*) and screwbean mesquite (*Prosopis pubescens*) land cover types toward the acreage goals of the LCR MSCP, and it continues to contribute valuable information about restoration techniques and management practices.

# 2.0 CONSERVATION AREA SITE INFORMATION

## 2.1 Purpose

The BLCA was developed both for native fishes and terrestrial wildlife species. The lake is intended to be managed for the razorback sucker (*Xyrauchen texanus*) and bonytail (*Gila elegans*) and is a continuation of the commitment to construct habitat for native fishes under the 1997 Biological and Conference Opinion. It does not provide creditable land cover acreage to the LCR MSCP. The riparian restoration area provides habitat for a variety of avian and small mammal species and provides creditable land cover type acreage to the program. Irrigation cycles for the riparian restoration area are evaluated annually to determine if conditions are appropriate for the species targeted by the LCR MSCP, specifically the southwestern willow flycatcher (*Empidonax trailii extimus*).

## 2.2 Location

The BLCA is located in Reach 3, between the Colorado River and Topock Marsh, on the Havasu NWR, near Needles, California. It is within the historic floodplain of the lower Colorado River and adjacent to River Mile 237 on the Arizona side (figure 1).

## 2.3 Landownership

The BLCA is located on the Havasu NWR, which is owned and managed by the USFWS.

## 2.4 Water

The BLCA receives water from the Havasu NWR's 2nd and 3rd priority water entitlement provided by the 1964 Supreme Court Decree in *Arizona* v. *California* and by U.S. Department of the Interior Secretarial reservation. The Havasu NWR's entitlement of 37,339 acre-feet per year consumptive use and 41,839 acre-feet diversionary right of Colorado River water is used to fill Topock Marsh through two instrumented inlet canals. The water used for irrigation at the BLCA is supplied from Topock Marsh.

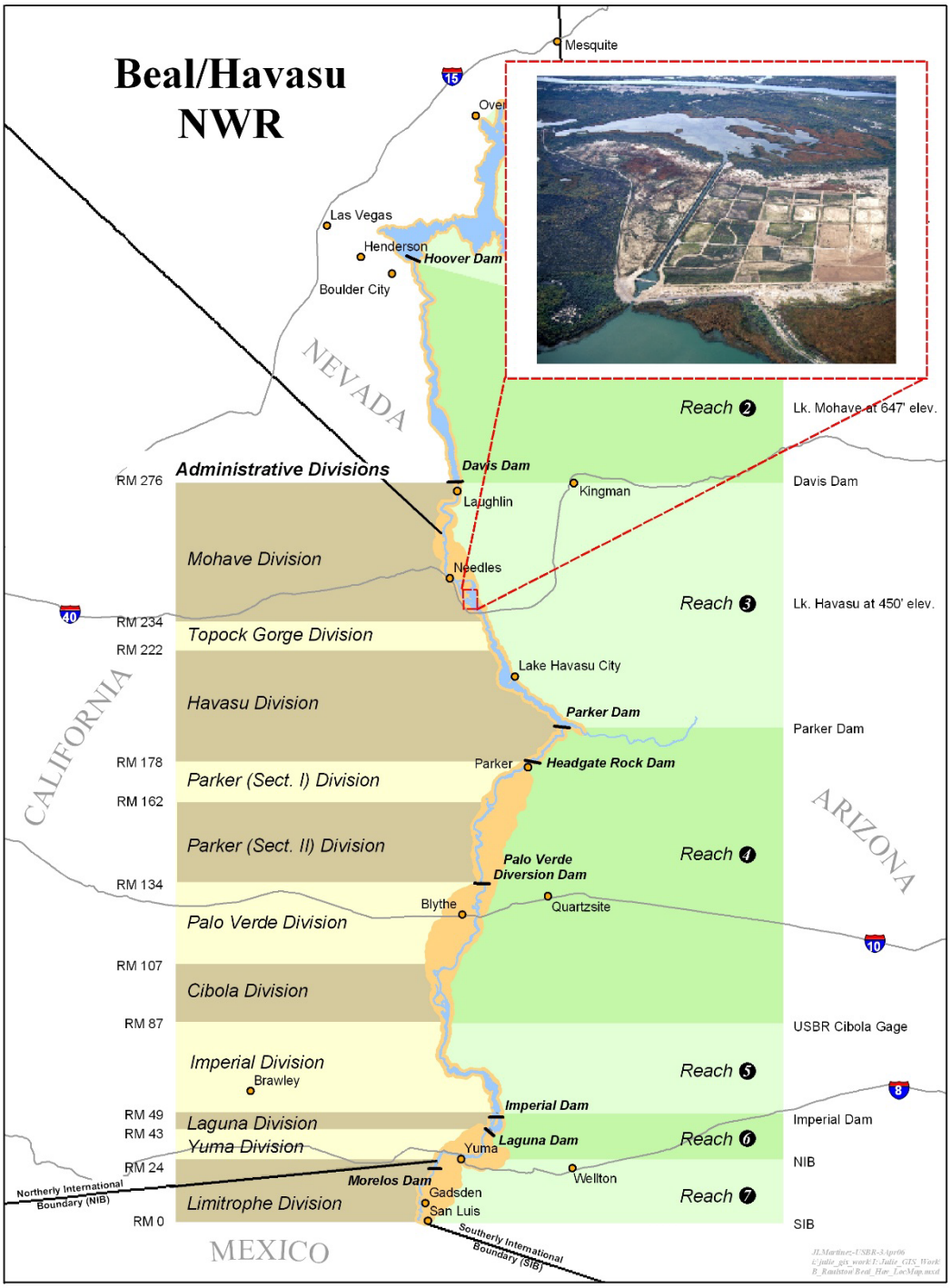


**Figure 1.—Location of the BLCA.**

## 2.5 Agreements

A Land Use Agreement was signed in 2010 by Reclamation and the USFWS to secure land and water for the BLCA for the remainder of the 50-year LCR MSCP. The agreement outlines the rights and responsibilities of each partner in the project's development and maintenance.

A new exhibit to the existing Land Use Agreement was signed in 2018 by Reclamation and the USFWS to secure additional land and water for the BLCA expansion area. The expansion area increased the total area of the BLCA from approximately 434 acres in size to 1,000 acres, and it will consist of approximately 300–400 acres of additional cottonwood-willow, honey mesquite, and marsh land cover types to be managed for LCR MSCP covered species.

## 2.6 Public Use

The BLCA is in an area that was closed to the public by the USFWS prior to becoming a conservation area, and it remains closed to the public.

## 2.7 Law Enforcement

Law enforcement activities at the BLCA are performed primarily by the USFWS's law enforcement officer under the LCR MSCP's site-specific Fire Management & Law Enforcement Strategy (LCR MSCP 2010). Additional local law enforcement assistance is available through the Arizona Game and Fish Department's Kingman Office, the Mohave County Sheriff's Office, and the Bureau of Land Management's Lake Havasu Field Office.

## 2.8 Wildfire Management

The USFWS will provide an appropriate management response to all wildfires that occur within the BLCA. The full range of suppression strategies is available to managers provided that selected options do not compromise firefighter or public safety, are cost effective, consider the benefits of suppression and the values to be protected, and are consistent with resource objectives (LCR MSCP 2010).

# 3.0 HABITAT DEVELOPMENT AND MANAGEMENT

Figure 2 shows the established land cover types being managed for LCR MSCP covered species.

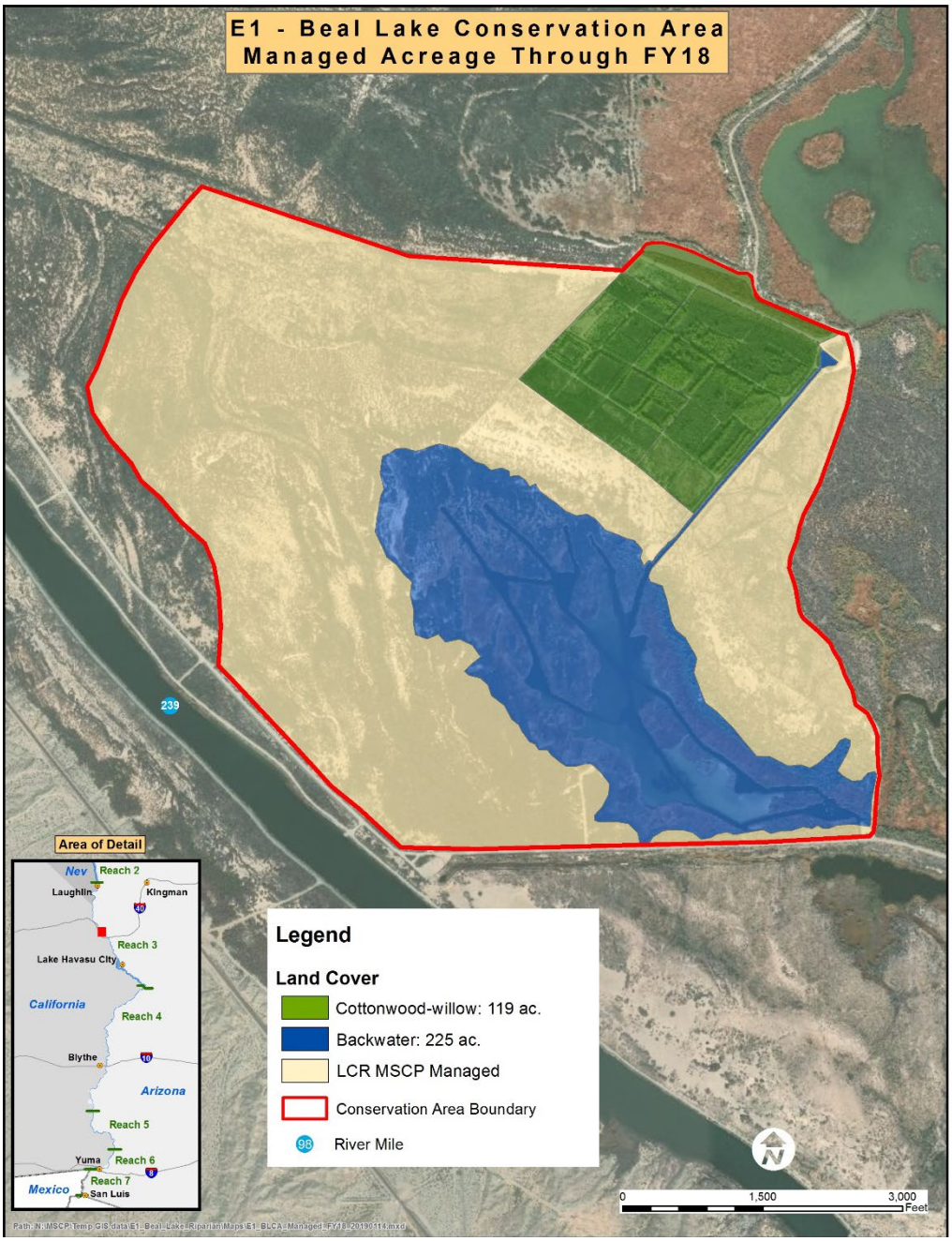


**Figure 2.—BLCA managed acreage through FY18.**

## 3.1 Planting

There were no new plantings at the BLCA during FY18.

## 3.2 Irrigation

The fields at the BLCA are independently flood irrigated from one alfalfa valve positioned in a corner of each field (figure 3). The fields are irrigated on a schedule that prioritizes establishing newly planted vegetation when applicable, creating microclimate conditions for LCR MSCP species, and preventing salts from accumulating in the soil. The fields recently planted or seeded with native vegetation are irrigated on a weekly basis, while fields with established stands of trees are either frequently irrigated to create microclimate conditions for covered species or are put on a reduced irrigation schedule to merely keep salts from accumulating in the soil.


**Figure 3.—Overview of the BLCA.**

The groundwater at the BLCA fluctuates both seasonally and spatially throughout the site. In summer, groundwater elevations at the BLCA are shallow, generally ranging between 2 and 8 feet below the ground surface because of high riverflows and the high water surface elevation in Topock Marsh. Given the shallow water table, established stands of native trees have access to groundwater and, therefore, require irrigation only to keep soil salinity levels from increasing over time.

An irrigation schedule (figure 4) is prepared prior to each growing season. As the growing season progresses, small changes are made to benefit resource conservation. Rain, temperature, humidity level, groundwater elevation, etc., factor into weekly irrigation management. During the 2018 irrigation season, 1,158 acre-feet of water was applied to the BLCA riparian fields compared to 1,101 acre-feet of water in 2017.

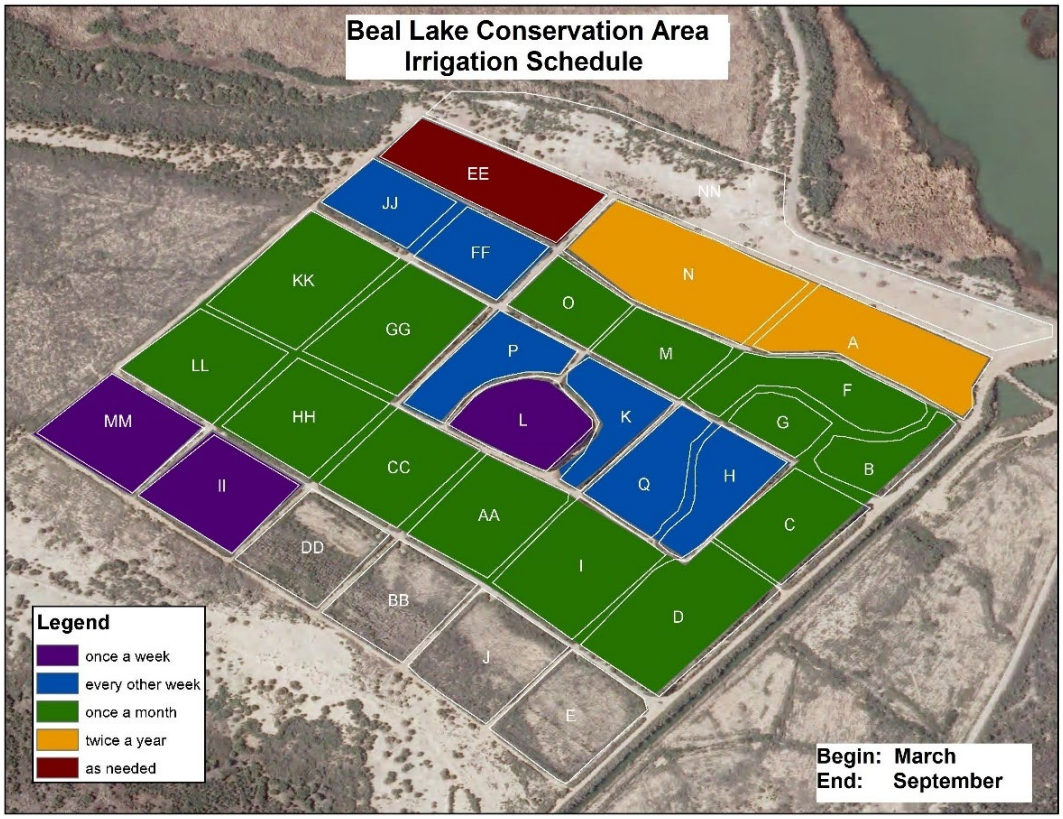


**Figure 4.—FY18 irrigation schedule for the BLCA.**

## 3.3 Site Management

Irrigation, maintenance, and cleaning of the wedge-wire screens were conducted at the BLCA from mid-March through mid-September. Routine maintenance (oil changes, fuel filters, fueling, etc.) was performed on the irrigation pump throughout

the year. A second irrigation pump was purchased to have on hand at the Yuma Area Office in order to avoid interruptions during the irrigation season if the existing pump were to fail.

In February 2018, the irrigation pump was rebuilt, and the water level in forebay area was pumped down so that maintenance on the wedge-wire screens could be performed. All four 0.6-millimeter wedge-wire screens on the Beal Lake rock structure were removed and cleaned before reinstalling, and new stainless steel flanges were installed. The four wedge-wire screens are removed, cleaned, and swapped annually to assist with Beal Lake's water surface elevation management. The screens not in use are stored at the Beal Lake maintenance yard. Routine scrubbing of the screens occurred every other week during the irrigation season.

# 4.0 MONITORING

## 4.1 Backwater Monitoring

Beal Lake monitoring information is used to estimate native fish abundance, characterize fish species composition in the lake, and measure habitat and water quality parameters. These data are intended to be used to help guide management of the lake for native fishes. All fisheries activities have been suspended due to the proposed dredging activities.

### 4.1.1 Native Fishes

Beal Lake is managed cooperatively by the USFWS Arizona Fish and Wildlife Conservation Office in Parker, Arizona, and the LCR MSCP. The lake is intended to provide habitat for razorback suckers and bonytail. A variety of techniques and gear types are used annually to sample and monitor native fish populations.

#### *4.1.1.1 Fish Stocking*

No native fishes were stocked in FY18 due to the proposed dredging activities. Native fish stockings will be initiated following the completion of the dredge work.

#### *4.1.1.2 Fish Monitoring*

Beal Lake is currently occupied by a variety of non-native fish species; native fishes have not been present since 2013. All monitoring activities were postponed due to the proposed dredging activities.

#### 4.1.1.2.1 Native Fish Populations

No native fishes have been detected following the March 2013 fishkill. Beal Lake is presumed to be devoid of native fishes at this time.

## 4.2 Avian Monitoring

Avian monitoring in FY18 included surveys for southwestern willow flycatchers, yellow-billed cuckoos (*Coccyzus americanus occidentalis*), marsh birds, and riparian breeding birds, as well as bird migration monitoring at a Monitoring Avian Productivity and Survivorship Station.

### 4.2.1 Southwestern Willow Flycatcher Surveys

Surveys to detect presence of southwestern willow flycatchers were conducted five times during FY18 in cottonwood-willow habitat. No breeding or resident southwestern willow flycatchers were detected; only migrant willow flycatchers (*Empidonax traillii*) were detected, all prior to June 14. Most birds detected after June 24 or individuals detected repeatedly before June 24 are considered to be southwestern willow flycatchers. Birds detected before June 24 and those detected only once after June 24 are considered migrant willow flycatchers (McLeod and Pellegrini 2019).

### 4.2.2 Yellow-billed Cuckoo Surveys

Four surveys for yellow-billed cuckoos were conducted within the riparian portion of the BLCA. During the first survey period (June 15 – June 30), there were two cuckoo detections. Two surveys were conducted during the second survey period (approximately July 1 – July 31) and resulted in five detections. Between approximately August 1–15, there was one detection.

There was one confirmed breeding territory at the BLCA in FY18. Due to the behavior of this species, detections alone do not indicate the number of cuckoos present, nor do detections confirm breeding. The number, timing, and location of detections, along with behaviors observed, may be used to estimate abundance, distribution, and/or breeding status. The possible, probable, and confirmed counts were used to estimate the number of breeding territories and not the number of breeding pairs. Territory estimates represent two adults associated with a single nest (Parametrix, Inc., and Southern Sierra Research Station 2019).

### 4.2.3 Marsh Bird Surveys

Presence surveys for the California black rail (*Laterallus jamaicensis coturniculus*), western least bittern (*Ixobrychus exilis hesperis*), Virginia rail (*Rallus limicola*), and Yuma clapper rail (*Rallus longirostris yumanensis* [also known as Yuma Ridgway's rail = *R. obsoletus yumanensis*]) were conducted in marsh habitat at the BLCA in three survey sessions during March and April. There were no detections of LCR MSCP covered species at Willow Marsh. At Beal Lake, there were two detections of the western least bittern during the first survey session (March 16). There were three detections of the Yuma clapper rail and four detections of the western least bittern during the second survey session (April 4). There were 9 detections of the Yuma clapper rail and 12 detections of the western least bittern during the third survey session (April 20) (Kahl, Jr. 2018).

### 4.2.4 General Avian Surveys

Bird surveys were conducted to detect breeding LCR MSCP riparian bird species and other territorial riparian bird species. Surveys were conducted within areas of the cottonwood-willow and honey mesquite land cover types that were of adequate growth to support breeding birds. General bird surveys resulted in the detection of 11 species (38 territories) of birds breeding within the surveyed plots. The Arizona bell's vireo (*Vireo bellii arizonae*) and Sonoran yellow warbler (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*) were confirmed breeding (SWCA Environmental Consultants 2019).

Table 1 shows the number of breeding territories of LCR MSCP covered species in FY18 (SWCA Environmental Consultants 2019).

Table 1.— Number of breeding territories per LCR MSCP covered species[1] at the BLCA, FY18

| LCR MSCP covered species | Number of confirmed breeding pairs |
|---|---|
| Arizona bell's vireo | 3 |
| Sonoran yellow warbler | 4 |

[1] Number of breeding territories refers to the number of territories that are within the sampled area for pairs that were confirmed breeding. Partial territories are possible, as the amount of each territory within the sampled area was estimated to be 0.25, 0.5, 0.75, or 1.0.

A bird banding station was operated 10 times from May 1 through July 30, 2018. Six yellow warblers (*Dendroica petechia*), five Arizona Bell's vireos, and one summer tanager (*Piranga rubra*) were captured and fitted with color bands. In addition, two summer tanagers and two Sonoran yellow warblers that were banded in prior years were recaptured (Dodge and Kahl, Jr., *in press*).

# 4.3 Small Mammal Monitoring

## 4.3.1 Bat Monitoring

Acoustic survey methods were used to monitor bats in order to document the presence of species using the BLCA. One long-term monitoring station was operated in the middle of the BLCA during June, July, and August 2018. Western red bats (*Lasiurus blossevillii*), western yellow bats (*Lasiurus xanthinus*), and California leaf-nosed bats (*Macrotus californicus*) were detected (table 2). Table 2 summarizes the total number of nights the four LCR MSCP species were detected in FY18 (Mixan and Diamond 2019).

Table 2.—LCR MSCP bat detections by month at the BLCA, FY18

| Month | Number of nights recorded | Total nights detected | | | |
|---|---|---|---|---|---|
| | | Western red bat | Western yellow bat | California leaf-nosed bat | Pale Townsend's big-eared bat[1] |
| June | 30 | 6 | 1 | 0 | 0 |
| July | 31 | 10 | 2 | 4 | 0 |
| August | 31 | 5 | 0 | 8 | 0 |

[1] Genetic analyses on the pale Townsend's big-eared bat indicate that the lower Colorado River is likely in the range of the Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*) rather than the pale Townsend's big-eared bat (Piaggio and Perkins 2005). The bats recorded along the lower Colorado River will be referred to as pale Townsend's big-eared bats in this report, as the nomenclature change has not yet been verified by the USFWS.

## 4.3.2 Rodent Monitoring

Live trapping was conducted in the fall and spring of FY18 to determine the presence of the Colorado River cotton rat (*Sigmodon arizonae plenus*). Eighty traps were set on transects at the BLCA for 2 nights from November 16–17, 2017. One hundred traps were set on transects at the BLCA for 2 nights from April 17–18, 2018. No Colorado River cotton rats were captured. Four desert pocket mice (*Chaetodipus penicillatus*) were captured in fall, and three desert pocket mice were captured in spring; based on range, it is possible they were of the *sobrinus* subspecies (Hill and Lyon 2019).

# 5.0 HABITAT CREATION AND CONSERVATION MEASURE ACCOMPLISHMENT

## 5.1 Vegetation Monitoring

Vegetation data were collected in FY18 using light detection and ranging (lidar). Lidar measures the vegetation structure throughout the canopy and provides the ability to identify structural diversity and successional growth stages. Conservation area vegetation will be evaluated on a periodic basis using lidar to ensure the habitat is meeting species' requirements. A procedure to analyze and provide vegetation structure metrics will be developed, and the results will be presented in future reports.

## 5.2 Evaluation of Conservation Area Habitat

The Final Habitat Creation Conservation Measure Accomplishment Tracking Process was finalized in October 2011 (LCR MSCP 2011). All areas within the BLCA were designed to benefit covered species at the landscape level.

To meet species habitat creation requirements, the Habitat Conservation Plan (HCP) provides goals for habitat creation based on land cover types. These land cover types are described using the Anderson and Ohmart vegetation classification system (Anderson et al. 1976, 1984a and 1984b). Twelve species with habitat creation goals have creditable acres at the BLCA. These species, including their corresponding conservation measure acronyms, are: southwestern willow flycatcher (WIFL1), western red bat (WRBA2), western yellow bat (WYBA3), Colorado River cotton rat (CRCR2), yellow-billed cuckoo (YBCU1), elf owl (*Micrathene whitneyi*) (ELOW1), gilded flicker (*Colaptes chrysoides*) (GIFL1), Gila woodpecker (*Melanerpes uropygialis*), (GIWO1), vermilion flycatcher (*Pyrocephalus rubinus*) (VEFL1), Arizona Bell's vireo (BEVI1), Sonoran yellow warbler (YWAR1), and summer tanager (SUTA1) (table 3).

Table 3.—Species-specific habitat creation conservation measure creditable total acres for 2018[1]

| Species-specific habitat creation conservation measure | WIFL1 | WRBA2 | WYBA3 | CRCR2 | YBCU1 | ELOW1 | GIFL1 | GIWO1 | VEFL1 | BEVI1 | YWAR1 | SUTA1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Creditable acres in 2018 | 0[2] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total, including previous years** | **0** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** | **119[3]** |

[1] The habitat creation accomplishment analysis was not performed for FY18 due to lidar data not being available.

[2] Although the BLCA provides the appropriate structure type (cottonwood-willow I–IV) as defined in WIFL1, the LCR MSCP is in the process of gathering the appropriate hydrologic data to determine saturated soils, moist soils, or slow-moving water. Once this has been determined, the BLCA will be evaluated.

[3] In previous years, an incorrect number was reported for creditable acreage. The additional planting, known as Willow Marsh, was reported as 9 acres; it is actually 12 acres.

# 6.0 ADAPTIVE MANAGEMENT RECOMMENDATIONS

Adaptive management relies on the initial receipt of new information, the analysis of that information, and the incorporation of the new information into the design and/or direction of future project work (LCR MSCP 2007). The Adaptive Management Program's role is to ensure habitat creation sites are biologically effective and fulfill the conservation measures outlined in the HCP for 27[1] covered species and to determine if they potentially benefit 5 evaluation species. Post-development monitoring and species research results will be used to adaptively manage habitat creation sites after initial implementation. Once monitoring data are collected over a few years, and then analyzed for the BLCA, recommendations may be made through the adaptive management process for site improvements in the future.

There are no adaptive management recommendations for the BLCA at this time.

[1] The northern Mexican gartersnake (*Thamnophis eques megalops*) was added as a covered species by an amendment to the Program Documents on March 5, 2018.

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